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ABSTRACT

An experimental preservice teacher education program was developed to train prospective high school teachers to increase academic learning time through identification and arrangement of instructional tasks of personal and social significance. Participants were 34 junior-level prospective teachers who were subjected to two treatments which culminated in a 3-week pre-student-teaching clinical experience at a university laboratory high school. Twelve high school classes, comprising approximately 280 students, were involved in the study. Random pairs of subjects, one from the experimental group and one from the control group, were assigned to high school classes. The supervising teacher of each high school class selected a chapter from the text being used by the class, and subject pairs assigned to each class were given a semester to prepare to teach the chapter's content to students. Subjects in the control group received a traditional competency based teacher education program. Subjects in the experimental group received task-significance training, which begins with content analysis, proceeds to identifying educational levels, and then establishes appropriate behavioral objectives. Results supported the prediction that teachers in the experimental program would increase academic learning time to a greater extent than would subjects in the traditional program. (JMK)

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The Effects of Task Significance Training on the Ability of Prospective Teachers to Increase Academic Learning Time

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The Effects of Task Significance Training on the Ability of Prospective Teachers to Increase Academic Learning Time

Recent reports of research on teaching indicate a positive relationship between achievement and the amount of time pupils spend on instructional tasks. The findings have implications for both inservice and preservice teacher education. Time as a variable affecting achievement has been conceptualized in different ways and implications for improving teacher effectiveness, drawn from research, reflect the different conceptualizations. The time variable is generally reported in the literature as allocated time, engaged time, or academic learning time; the different categories represent a gradual refinement of the variable. Allocated time is a measure of the time teachers schedule for different subjects or activities; engaged time is that period in which students engage in or attend to instructional tasks; and academic learning time is the time students engage in instructional tasks at which they can be successful. Academic learning time incorporates allocated and engaged time and adds the element of success rate.

When implications are drawn from research involving allocated time, teachers are encouraged to increase allocated time through efficient classroom management (Arlin, 1979) or by extending time beyond the classroom (Keith, 1982). Research on engaged time has led to investigations of teacher strategies which best keep students attending to instructional tasks. Strategies associated with direct instruction, such as monitoring, feedback and reinforcement are found to be most effective (Capie and Tobin, 1981; Graham and Heimerer, 1981; Noon and Shalaway, 1981; Squires, et. al.,

1981; McLaughlin, et. al., 1979). By incorporating the success component studies involving academic learning time imply the importance of content decisions as well as management and strategy (Reith, 1981; Fisher, 1979). Four recent comprehensive reviews of research on the time variable report that academic learning time shows the strongest relationship to achievement (Anderson, 1980; Borg, 1980; Fisher, 1980; Stallings, 1980). All four reviews conclude with the observation that academic learning time is a potent variable affecting achievement.

Most of the efforts to improve teacher effectiveness by increasing pupil time on task have been made with inservice teachers. However, implications for preservice training have been noted (Brandt and Gunter, 1981; Griffin, 1981), and the measure of time on task has been recognized as a valuable tool for teacher self-evaluation (Aufderheide, 1981; Anderson, 1980). Borg (1980) in his review suggest that academic learning time can serve as a basis for teacher certification. Helping prospective teachers to increase academic learning time in their contacts with pupils prior to certification is likely to become part of teachers education programs, but the goal of increasing academic learning time is not without shortcomings or dangers.

The success component in academic learning time is probably both its strength and weakness. Obviously pupils do not learn what is too difficult for them, nor do thay stay engaged when they are experiencing failure. Emphasizing success rate, however, can lead to setting minimum objectives that require only lower-order learning and that ultimately become

unchallenging to students. The same misgivings that educators express about competency based instruction, that objectives become mechanistic, test-driven and divorced from the real world (Hyman and Cohen, 1979), have been leveled at academic learning time. McNamara (1981) in a critique of academic learning time research laments an "overconcern with static educational objectives" and says, "the result of this sort of research is an enervating, artificial curriculum in which highly structured, mechanical learning is geared to rigid, formal testing" (p. 295). Kepler (1980), while suggesting how research findings can be implemented in teacher training programs, cautions against too narrow a view of classroom teaching. Helping prospective teachers to increase academic learning time must include attention to the quality of instructional tasks in which pupils are expected to engage and at which they are expected to succeed.

The experimental preservice teacher education program reported in this paper was developed to train prospective high school teachers to increase academic learning time during unit sized instruction through the identification and arrangement of instructional tasks of personal and social significance. Academic learning time was defined in this study as the time pupils spend independently engaged in a learning task; independent engagement could be both accurately measured and serve as a reasonable indicator of attention and motivation. The program was tested in a three-week pre-student-teaching clinical experience in a university laboratory high school. The performance of prospective teachers in the experimental program was compared to that of prospective teachers in the

traditional program. It was predicted that subjects in the experimental program would increase academic learning time to a greater extent, and that the pupils of prospective teachers in the experimental program would show greater achievement of unit content.

Method

Subjects

Thirty-four junior-level prospective teachers, enrolled in two secondary education classes, were subjected to two treatments (N=17) which were to culminate in a three-week pre-student-teaching clinical experience at a university laboratory high school. Twelve high school classes, comprising approximately 280 pupils, were involved in the study.

Procedures

Random pairs of subjects, one from the experimental group and one from the control group, were assigned to high school classes. The supervising teacher of each high school class selected a chapter from the text being used by the high school class. Subject pairs assigned to each class were given a semester to prepare to teach the content of the chapter to random sample learner groups at the end of the semester.

The control treatment. Subjects in the control group received a traditional CBTE program. This program is based on a Tylerian rationale which begins planning with having students learn to state objectives and teaches them to perform skills appropriate to the objectives. The program at Illinois State University is organized around lesson-sized

instructional sequences. Lessons are differentiated in the program according to the categories of the Taxonomy of Educational Objectives, Handbook 1: Cognitive Domain. Teaching skills associated with each category of the Taxonomy were practiced in microteaching prior to the clinical experience at the laboratory school.

The experimental treatment. Subjects in the experimental group received task significance training. This training is based on the rationales found in curriculum literature for teaching subject matter in schools. It begins with an analysis of content. Educational objectives are derived from the analysis and subjects taught to adopt instructional procedures as appropriate to the objectives. In order to accommodate all rationales found in curriculum literature, the ISU program was reorganized around unit-sized instructional sequences. Task significance training proceeded in three phases.

In phase I three levels of educational significance were identified. These levels were derived from the rationales for teaching subject matter commonly used by curriculum theorists. They are: 1) An intellectual rationale which dictates that subject matter be selected on the basis of its importance to future learning in the discipline. 2) A personal rationale which dictates that subject matter be selected on the basis of its relevance to learners' needs and interests. 3) A social rationale which dictates that subject matter be selected on the basis of its potential for resolving social issues. In task significance training subject matter selected on the basis of its importance to the discipline

is treated as the lowest level of educational significance and subject matter selected on the basis of social utility as the highest. The training required prospective teachers to build a knowledge structure comprising the three levels of educational significance. The lowest level of the knowledge structure involved having prospective teachers select the most general ideas in the textbook chapter and organize them around a general principle that subsumes and relates other ideas found in the chapter. The second level of the knowledge structure involved having prospective teachers identify problems of a personal nature that might be solved by utilizing the major ideas of the textbook chapter and having them identify problem solving techniques that would be used by people educated in the discipline. The highest level of the knowledge structure involved having prospective teachers identify issues of social significance that could be addressed using the subject matter and the modes of thought acquired at the lower levels. Figure 1 is an example of a knowledge structure based on a textbook chapter involving parliamentary procedure.

Knowledge Structure

Level I Parliamentary procedure was developed by the English Parliament in order to organize meetings and maximize efficient use of time.

A. Parliamentary procedure consists of five basic principles: One question at a time is considered. The majority rules. Minority rights are protected. There is equality of rights and responsibilities. There is free debate.

B. In meetings, each of the principles is used as well as specific rules provided by parliamentary procedure; they control when and how meetings are held and the duties of those who take part.

C. Parliamentary procedure is put into action through the use of motions by which goals are accomplished.

Level II Through the use of the principles of parliamentary procedure one can look at any situation democratically and make decisions based on information gained through its use.

A. The use of parliamentary procedure can be helpful in making personal decisions if one forces oneself to look at all sides of a single questions before deciding.

B. Family decisions can be made more democratically and satisfactorily if they are arrived at as a group using parliamentary procedures.

C. A class or an organization can accomplish more to the satisfaction of most of its members if it organizes its meetings in the ways suggested by parliamentary procedure.

Level III Parliamentary procedure can be used throughout the world to provide individuals a means to express their ideas for consideration by the whole group.

A. On the local level government could be more democratic if more people were allowed to participate, and more could participate if parliamentary procedures were used.

B. Consumers could provide feedback to producers and producers could better understand what consumers want through the use of parliamentary procedure.

C. Today's technology and the use of parliamentary procedure could allow more people to voice their opinions and get more involved in democratic government.

Figure 1

In phase II prospective teachers use the Taxonomy of Educational Objectives to formulate behavioral objectives that correspond to the levels of educational significance outlined in their knowledge structures. The categories of objectives specified in the taxonomy blend well with the content analysis made in task significance training. The categories knowledge and comprehension are used at the lowest level since they are most appropriate to the goal of acquiring subject matter. At the second

level the categories application and analysis are used as most appropriate to working on tasks of personal significance. At the highest level the categories synthesis and evaluation are used in addressing issues of social significance. Figure 2 is an example of behavior objectives based on the knowledge structure of the textbook chapter on parliamentary procedure.

Behavioral Objectives

Level I

Knowledge:	Given a test on parliamentary procedure, the student will list five basic principles and four kinds of motions used in parliamentary procedure with 80% accuracy.
Comprehension:	Given ten examples of motions made during meetings using parliamentary procedure, the student will identify the types of motions with 80% accuracy.

Level II

Application:	Given a description of a meeting to be held to deal with discipline problems in the school, the student will write a plan for chairing the meeting which conforms to the standards of parliamentary procedure.
Analysis:	Given an agenda for an organization's meeting, the student will identify strengths and weaknesses in the agenda, suggest improvements.

Level III

Synthesis:	Given a social issue currently being discussed in the press (military spending, social security, busing), the student will devise a plan using parliamentary procedure which could result in the resolution of the issue and which is technologically possible.
Evaluation:	Given an opportunity to observe two groups using parliamentary procedure to resolve social issues (videotapes of city council meetings), the student will judge the meetings and defend the assessment.

Figure 2

In phase III prospective teachers planned instructional procedures to correspond to the levels of educational significance reflected in behavioral objectives. At the lowest level, during which subject matter is being acquired, techniques of direct instruction were emphasized. Direct instruction gives teachers the maximum control over classroom interaction and this control is seen as necessary in initial stages of instruction to insure pupil attention and successful acquisition. At the second level, during which subject matter is applied to problems of personal significance, techniques of classroom management were emphasized. Management techniques, such as self-pacing and individualized learning packages, lessen direct teacher control while maximizing pupil-content interactions. At this level pupil interest may be expected to insure engagement and the successful acquisition of knowledge at the previous level to insure pupil success. At the highest level, during which subject matter is used to address social issues, indirect instructional techniques were emphasized. Indirect instructional techniques, such as supportiveness, acting as a resource person or counseling students about difficulties, represent the least teacher control while maximizing pupil interaction with high-order content. At this level continued pupil interest may be expected to insure engagement and successful application of knowledge at the previous level to insure pupil success. Figure 3 represents a model of task significance training and the expected increases in academic learning time.

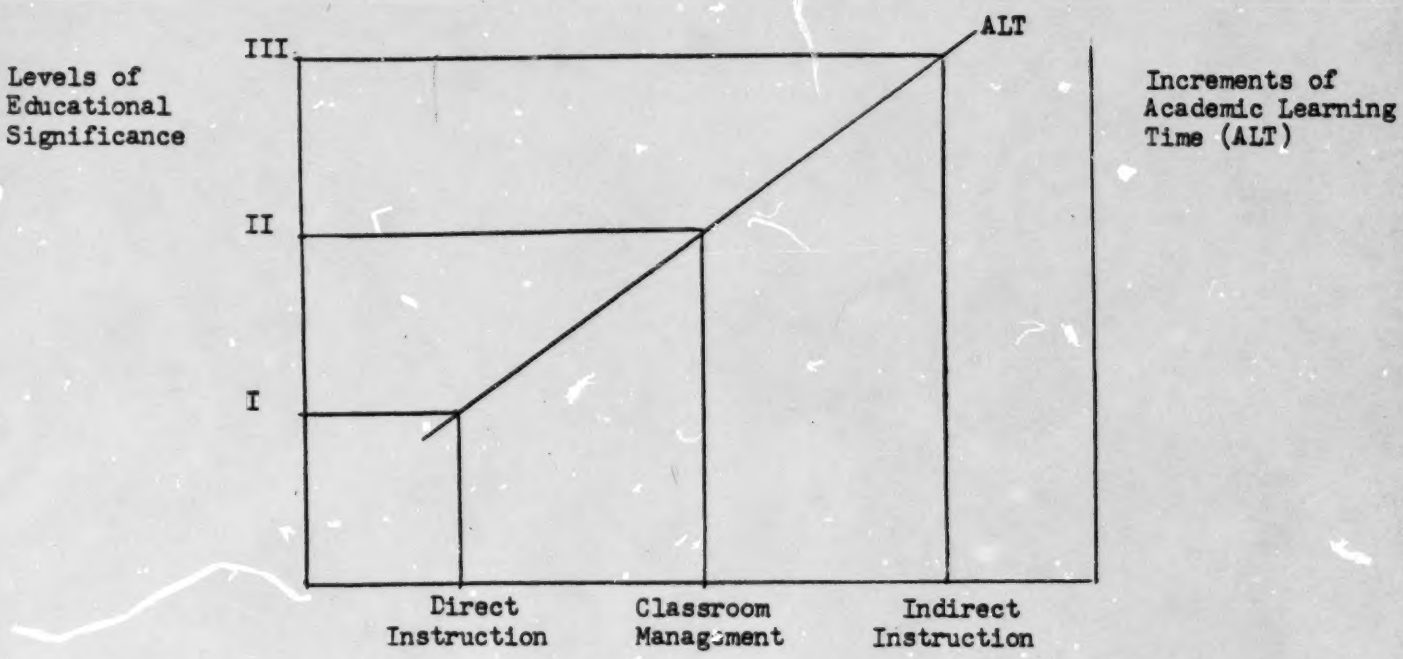

Figure 3

At the conclusion of the treatments subject pairs returned to the university's laboratory school to teach their units to high school pupils. Prospective teachers worked with high school pupils in 50-minute sessions, five days a week, for three weeks.

Academic learning time was recorded daily by trained student observers and by supervising teachers. Discrepancies, if they existed, were resolved by the observers in conference. Average weekly academic learning time was computed for analysis. A multiple-choice achievement test over the unit topic was constructed by the supervising teacher from a pool of items submitted by the subject pairs; it was administered to high school pupils at the end of the unit. Attitudes of high school pupils toward their experiences with prospective teachers were measured by the Classroom Attitude Questionnaire, an instrument developed at the University of Illinois.

Results

A 2 (treatment) by 3 (week number) analysis of variance, repeated measures was performed on average academic learning time. A main effect for treatment was obtained, $F(1, 32) = 19.83$, $p < .001$, indicating that students in the experimental program increased academic learning to a greater extent than students in the traditional program. Academic learning time increased most notably for the experimental group during the second week of the clinical experience. Table 1 shows average weekly academic learning time.

	Average Percent Academic Learning Time		
	Week 1	Week 2	Week 3
Experimental Group	29.1	54.1	61.8
Control Group	24.6	27.8	33.2

Table 1

Pupil achievement measures indicated comparable subject matter acquisition for the pupils of subject pairs. Scores favored the experimental group but were not statistically significant ($t = .913$).

Attitude measures indicated that high school pupils working with prospective teachers in the experimental program perceived those teachers as "talking" a significantly smaller percentage of the time ($t = 5.40$, $p < .001$). Other items on the attitude questionnaire did not reach significance.

Conclusions and Discussion

The prediction that prospective teachers in the experimental program would increase academic learning time to a greater extent than subjects in the traditional program was supported in the study. High school pupils' perception that subjects in the experimental program "talked" less adds to the support. Together, the findings may be taken as evidence that experimental subjects were successful in achieving self-directed participation from their pupils and that task significance training was basic to that success. The notable increase in academic learning time during the second week of the unit, sustained through the third week, suggests that pupil engagement is best achieved when personal and social relevance of subject matter becomes the organizing focus of classroom interaction.

The prediction that pupils of prospective teachers would score higher on tests of achievement over unit content was not realized. Scores favored the experimental group but were not statistically significant. The finding may be due to the measuring instruments which were constructed from pools of items which generally assessed lower-order learning. The introduction of other evaluation procedures, or the development of more sensitive tests, is a priority for future investigations. The fact that scores favored the experimental group allows the conclusion that independent engagement in instructional tasks of personal and social significance causes no diminution in the learning of facts and principles.

Analysis of responses on the Classroom Attitude Questionnaire yielded no significant differences between the treatment groups. This finding may

be interpreted as demonstrating that prospective teachers in the experimental program were successful in getting pupils to work independently without sacrificing positive attitudes.

Results of the study indicate that prospective teachers can achieve academic learning time without recourse to minimum, mechanistic objectives. The study supports the contention that academic learning time is a viable concept for preservice teacher education programs. When attention is given to the quality of tasks that pupils are expected to engage in and succeed at, academic learning time can be a valuable tool for teacher self-evaluation, a valid measure of teacher effectiveness, and an objective standard for certification. Analyzing content to identify the personal and social significance of subject matter is one way of controlling quality and avoiding the weaknesses associated with time variables.

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